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[TXD 4: Wool and Wool Products]

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(दूसरा पुनरीक्षण)

Indian Standard

TEXTILE FLOOR COVERING — TUFTED CARPETS — SPECIFICATION

(Second Revision)

UDC 677·074·543

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

June 1993 **Price Group 4**

Textile Floor Coverings Sectional Committee, TX 16

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Textile Floor Coverings Sectional Committee had been approved by the Textile Division Council.

This Indian Standard was first published in 1970 and subsequently revised in 1987. This standard has been again revised to cover carpets made from wool/man-made fibre blend and also from 100 percent man-made fibres. The earlier version of this standard covered only wool carpets.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

TEXTILE FLOOR COVERING TUFTED CARPETS — SPECIFICATION

(Second Revision)

1 SCOPE

1.1 This standard prescribes the constructional particulars and performance requirements of tufted carpets made from wool or man-made fibres or their blends.

1.2 This standard does not specify the general appearance, design etc. of the carpets.

2 REFERENCE

The standard listed at Annex A are necessary adjuncts to this standard.

3 TERMINOLOGY

For the purpose of this standard, definitions given in IS 11205 : 1984 shall apply.

4 MANUFACTURE

4.1 Pile Yarn

The yarn used in the manufacture of pile or tufts of carpet shall be made from wool or man-made fibres or their blends spun on woollen, semi-worsted or worsted system.

4.2 Backing

The jute carpet backing fabric [*see* IS 4900 (Parts 1 to 3) : 1984] or any other suitable backing material shall be used as a medium into which the pile yarn is tufted.

4.3 Back-Coating

The carpet after tufting shall be coated with latex or any suitable synthetic coating.

4.4 Secondary-Backing

A secondary-backing of jute or any other suitable material may be firmly bonded to the carpet, if required by the buyer.

4.5 Moth-Resistance

If agreed to between the buyer and the seller or declared by the seller, the carpet containing wool shall be rendered moth-resistant. For this purpose treatments specified in IS 11662 : 1986 or any other suitable treatment agreed to between the buyer and the seller shall be used.

5 REQUIREMENTS

5.1 Length and Width

The length and width of the carpet shall be as agreed between the buyer and the seller or as declared by the seller on the label of the carpet.

5.1.1 *Tolerances*

In case of carpet sold as square and rug, a tolerance of ± 15 mm per metre shall be permitted on agreed or declared value of length and width subject to a maximum of 10 cm for length and 5 cm for width. In case of carpets sold as piece-goods in running length, a tolerance of ± 15 mm per metre subject to a maximum of 5 cm shall be permitted on agreed or declared value of width only and the length shall not be less than the declared or agreed value.

5.1.2 The length and width of the carpet shall be determined by the method prescribed in IS 7877 (Part 5) : 1976.

5.2 Blend Composition of Pile Yarn

The blend composition of the pile yarn shall be as agreed to between the buyer and the seller or as declared by the seller subject to a tolerance of ± 2 percent unit.

5.2.1 The blend composition shall be determined as per method prescribed in IS 2005 : 1988 or IS 2006 : 1988 or IS 3421 : 1988 or IS 6503 : 1988 depending upon the type of fibres present in the blend.

5 3 Pile Density

The pile density of the carpet shall be as agreed to between the buyer and the seller or as declared on the label subject to a minimum of 50 g/m^2/mm pile thickness. However, a tolerance of minus 5 percent shall be permitted on the agreed or declared value.

NOTE — Normally tufted carpets are manufactured in the range of 50 to 120 g/m^2/mm pile thickness.

5.3.1 The pile density of the carpet shall be determined by the method prescribed in Annex **B-2**.

5.4 Pile Thickness

The pile thickness of the carpet shall be as agreed to between the buyer and the seller subject to a minimum of 3 mm.

5.4.1 The pile thickness of the carpet shall be determined by the method prescribed in Annex **B-2**.

5.5 Colour Fastness

The cumulative colour fastness ratings of a carpet towards light, water, shampooing and dry rubbing shall be not less than 13 subject to a minimum of 4 for light and 3 each for other agencies. For the purpose of this requirement the minimum rating obtained by any shade out of the shades carpet to that agency. A tolerance of – 1 unit shall, however, be permitted on the declared value of the cumulative colour fastness rating.

NOTE — The maximum colour fastness ratings achievable by these agencies are 8, 5, 5 and 5 respectively totaling 23.

5.5.1 The colour fastness of pile yarn to various agencies shall be determined by the methods specified in IS 686 : 1985 or IS 2454 : 1985 (*see* Note), IS 766 : 1988, IS 767 : 1988 and IS 11969 : 1686.

NOTE — In case of dispute, colour fastness to light shall be determined by the method specified in IS 686 : 1985.

5.6 Tuft Withdrawal Force

The minimum tuft withdrawal force shall be 1·5 and 2·5 kg for cut pile and loop (uncut) pile respectively.

5.6.1 The tuft withdrawal force shall be determined by the method given in **B-3**.

5.7 Moth Resistance

In case a carpet containing wool is rendered moth-resistant as per the treatment specified in IS 11662 : 1986, the amount of preservative agents used shall satisfy the requirements given in IS 11662 : 1986. In case any other moth-resistant treatment is used, the type of preservative agent, method of its application, amount applied and method of its determination shall be a matter of prior agreement between the buyer and the seller.

6 LABELLING

6.1 A white cloth label of 10 × 7·5 cm or a paper sticker marked with the following information shall be securely attached or fixed to one of the corners on the back of the carpet:

a) Name of the product;

b) Type of pile, that is loop (uncut) pile or cut pile;

c) Length × width of carpet, in cm;

d) Blend composition of pile yarn;

e) Pile height (mm);

f) Pile density (g/m^2 per mm pile thickness);

g) Cumulative colour fastness ratings;

h) The words ‘Treated for Moth-Resistance; (in case of carpets containing wool)’ and

j) Indication of the source of manufacture.

6.2 The labels may also carry Standard Mark.

7 PACKING AND MARKING OF PACKAGES

7.1 Unless otherwise agreed, the carpets shall be packed by the method given in IS 5756 : 1970. The packages shall also be marked with the information as required in IS 5756 : 1970.

8 SAMPLING AND CRITERIA FOR CONFORMITY

8.1 Lot

the carpets having same pile yarn blend, density and pile thickness delivered to a against a despatch note shall constitute a

The conformity of the lot to the requirets of this standard shall be determined on the basis of the tests carried out on the sample selected from the lot.

8.3 Unless otherwise agreed to between the buyer and the seller, the number of carpets to be selected at random shall be as given in Table 1.

Table 1 Sampling Plan

Number of Carpets in the Lot (1)	Sample Size (2)	Sub-Sample Size (3)
Up to 15	3	2
16 to 25	5	3
26 to 50	8	3
51 to 100	13	5
101 and over	20	5

8.4 Number of Samples and Criteria for Conformity

The number of carpets in the samples and criteria for determining conformity of the lot to the requirements specified in this standard shall be as under:

Characteristics Conformity	*Number of Test Samples*	*Criteria for*
Length and width	All carpets	Carpets not conforming to **5.1** and **5.1.1** shall be rejected.
Pile thickness	According to col 2 of Table 1	All the test samples shall satisfy the relevant requirements
Moth-resistance, pile density, colour fastness, tuft withdrawal force and blend composition	According to col 3 of Table 1	

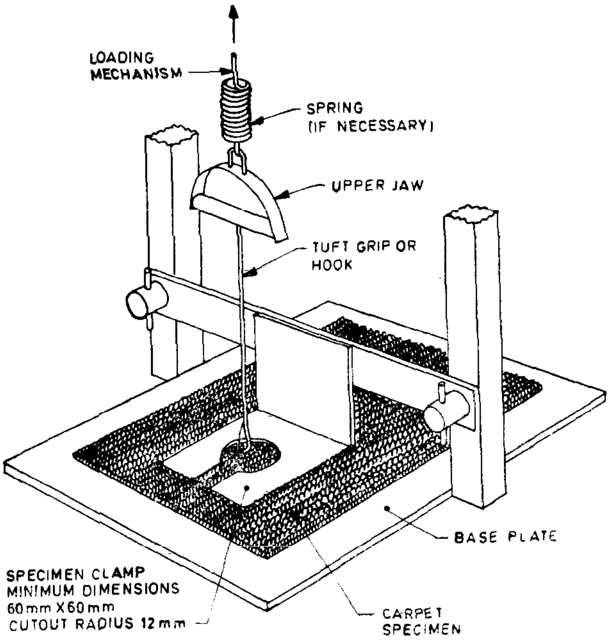

FIG. 1 A TYPICAL FORM OF HORIZONTAL MOUNTING

ANNEX A

(*Clause* 2)

LIST OF REFERRED INDIAN STANDARDS

IS No.	*Title*
196 : 1966	Atmospheric conditions for testing (*revised*)
686 : 1985	Methods for determination of colour fastness of textile materials to daylight (*first revision*)
766 : 1988	Method for determination of colour fastness of textile materials to rubbing (*first revision*)
767 : 1988	Method for determination of colour fastness of textile materials to water (*first revision*)
2005 : 1988	Method for quantitative chemical analysis of binary mixtures of nylon 6 or nylon 6.6 fibres and certain other fibres (*second revision*)
2006 : 1988	Methods for quantitative chemical analysis of binary mixtures of protein fibres with certain other non-protein fibres (*second revision*)
2454 : 1985	Method for determination of colour fastness of textile materials to artificial light (Xenon lamp) (*first revision*)
3421 : 1988	Textiles — Binary mixtures of acrylic, certain modacrylics and certain other fibres — Methods for quantitative chemical analysis (*first revision*)
4900 (Part 1) : 1984	Jute carpet backing fabric — General (*first revision*)
4900 (Part 2) : 1984	Jute carpet backing fabric — 237, 271, 305, 339 and 407 g/m^2 (*first revision*)
4900 (Part 3) : 1984	Jute carpet backing fabric — 186 and 203 g/m^2 (*first revision*)
5756 : 1970	Code for packaging of carpets
6503 : 1988	Method for quantitative chemical analysis of ternary mixtures of protein fibres, nylon 6 or nylon 6·6 and certain other fibres (*first revision*)
7877 (Part 5) : 1976	Methods of sampling and tests for hand - made carpets — Determination of dimensions
11205 : 1984	Classification and terminology of textile floor coverings
11662 : 1986	Preservative treatments of textiles
11969 : 1986	Method for determination of colour fastness of textile floor coverings to shampooing

ANNEX B

(*Clauses* 5.3.1, 5.4.1 *and* 5.6.1)

METHODS OF TEST TO DETERMINE PILE THICKNESS, PILE DENSITY AND TUFT WITHDRAWAL FORCE OF TUFTED CARPETS

B-1 ATMOSPHERIC CONDITIONS FOR TESTING AND CONDITIONING OF TEST SPECIMENS

B-1.1 The tests shall be carried out in a standard atmosphere of 65 ± 2 percent relative humidity and 27 ± 2° C temperature (*see also* IS 196 : 1966).

B-1.2 Prior to testing, the test specimens shall be conditioned to moisture equilibrium in the standard atmosphere. When the test specimen have been left in such an atmosphere for 72 hours in such a way as to expose, as far as possible, all portions of the test specimens to the atmosphere, they shall be deemed to have reached moisture equilibrium.

B-2 DETERMINATION OF PILE THICKNESS AND PILE DENSITY

B-2.1 Test Specimens

B-2.1.1 Cut four specimens, each at least 200 × 200 mm with the two sides parallel and the other two perpendicular to the selvedge.

B-2.1.2 If there is any tendency for the edges to fray, seal them with adhesive and allow to dry. Condition the specimens to constant weight in the standard atmosphere.

B-2.2 Apparatus

B-2.2.1 *Carpet Shearing Machine*

Capable of shearing the pile close to the backing of the carpet.

B-2.2.2 *Carpet Thickness Tester*

a) should have a circular plane pressure-foot of area between 300 and 1 000 mm².

b) should be capable of exerting a pressure of 20 gf/cm² normal to the plane of the specimen.

c) should be capable of measuring thickness to any accuracy of 0·1 mm over a range of 25 mm.

B-2.2.3 *Sharp Pointed Knife*

B-2.2.4 *Measuring Scale* — graduated in millimetres.

B-2.2.5 *Weighing Balance* — to weigh to an accuracy of 10 mg.

B-2.2.6 *Press and Cutter* — of known area of at least 10 000 mm², which may be circular or square in shape.

B-2.3 Test Procedure

B-2.3.1 Measure the thickness of each specimen at 5 places under the standard pressure of 20 gf/cm².

B-2.3.2 Determine the mass of pile using the method given below before the edges of the pile have been sealed as given in **B-2.1.2**.

a) Weigh each specimen to the nearest 10 mg (M_1);

b) Measure the length and width at four places on the back of each specimen to the nearest mm.

c) Shear the pile from the specimen using forward strokes with the clipper in all directions. Shear as close as possible to the backing by running the points of the comb and cutter along the backing without digging in. Avoid plucking any tufts or damaging the backing yarn. Brush, blow or suction clean the specimen during and after shearing. Continue shearing until no further significant amount of pile yarn dust appears on the shearing blades or flies away when the specimen in shaken. It is not necessary to shear to the edges of the specimen provided the area of at least 10 000 mm² in the centre is closely shorn.

d) After shearing, cut the area of 10 000 mm² from the centre of each specimen using a cutter. The backing yarns in this area shall be undamaged and no tufts shall have been plucked from it.

e) Condition each area cut out of the shorn carpet specimen in the standard atmosphere until successive weighings at intervals of 2 hours shown no progressive change greater than 0·25 percent. Record the final conditioned mass of the shorn area to the nearest 10 mg (M_2).

f) From the measurements made in (b), calculate for each specimen the average length and width and the area in square millimetres (A_1).

g) Calculate the total mass per square millimetre of carpet for each specimen separately $\frac{(M_1)}{(A_1)}$.

h) Measure the area of the specimen cut out of shorn carpet (A_2).

j) For each area of shorn carpet, calculate the mass per square millimetre $\frac{(M_2)}{(A_2)}$.

k) For each specimen, calculate the shorned mass of pile above unit area of backing, using the formula:

$$10^6 \left[\frac{M_1}{A_1} - \frac{M_2}{A_2}\right] \text{g/m}^2$$

where

$\frac{M_1}{A_1}$ = mass per mm² of carpet before shearing, and

$\frac{M_2}{A_2}$ = mass per mm² of carpet after shearing

m) Calculate the mean value of the shorned mass of pile above unit area of backing from the values obtained from all the specimens (M).

B-2.3.3 Measure the thickness of each shorn specimen as obtained in **B-2.3.2** (d) at 5 places under the standard pressure of 20 gf/m².

B-2.4 Calculations

B-2.4.1 *Pile Thickness*

For each specimen, calculate the mean thickness unshorn and the mean thickness shorn. Calculate for each specimen the thickness of pile as the difference between these figures in mm to the nearest 0·02 mm. Calculate the mean value of pile thickness for all the specimens in mm to the nearest 0·1 mm (t).

B-2.4.2 *Pile Density*

The pile density (in g/m² per mm pile thickness) shall be calculated by dividing the mean value of mass of pile above unit area of backing (M) by mean value of pile thickness (t).

B-3 DETERMINATION OF TUFT WITHDRAWAL FORCE

B-3.1 Apparatus

B-3.1.1 Tensile testing apparatus with suitable ranges and an accuracy of ± 5 percent. Full scale loads ranging from 0·5 to 10·0 kgf are generally adequate.

B-3.1.2 Apparatus shall preferably have a constant rate of loading but alternatively, constant rate of traverse or extension may be used. In any case the average test time for achievement of the maximum withdrawal force of the tufts and loops tested should be between 5 and 10 seconds. This may be achieved in machines which would give very short test time, for example, those using load cells, by inserting a spring between the loading mechanism and the specimen.

B-3.1.3 The apparatus shall have a means of clamping a specimen of carpet to a base plate so that it is flat in a plane perpendicular to the direction of pull upon the tuft or loop. The flat, horizontal part of the clamp, which is brought into contact with the specimen during testing, shall be at least 60 mm × 60 mm, shall have a circular cut out of 12 mm radius around the tuft, or loop to be withdrawn and shall retain the specimen inside this cut-out area (*see* Fig. 1). The cut-out may have a throat to allow easier positioning of the specimen with the tuft grip or hook attached.

B-3.1.4 For cut pile carpets, a suitable means of its selecting and gripping one end of a tuft shall be provided (for example, surgical forceps) and for loop pile carpets, a suitable hook (for example, a knitting machine needle) is required. These tufts grips are attached to the upper jaw of the tensile testing apparatus.

B-3.1.5 The load sensing mechanism of the machine shall be calibrated with the tuft grip or hook in position.

B-3.2 Test Samples and Specimens

Samples shall be selected from at least five places across the width of the carpet. Samples shall be conditioned as mentioned in **B-1.2**. Specimen should be cut (one from each sample) to a size which is convenient for clamping on the testing machine and which will allow for at least 10 tufts to be removed from each. No tufts shall be removed from within 25 mm of the edge of a specimen or of any previously withdrawn tuft.

B-3.3 Procedure

B-3.3.1 *Cut Pile Carpets*

Select one end of one tuft and attach the tuft grip. Clamp the specimen firmly and attach the tuft grip to the upper jaw. Set the machine in motion and withdraw the tuft completely in a direction essentially perpendicular to that of carpet specimen. Check that only one complete tuft is withdrawn, and record the maximum force.

B-3.3.2 *Loop Pile Carpets*

Select a suitable loop and engage the hook under the top of it. Clamp the specimen firmly and attach the hook to the uper jaw. Set the machine in motion to move the hook in a direction essentially perpendicular to that of carpet specimen, and stop it as soon as slippage occurs in the bend holding one of the loop sides. Record the maximum force.

B-3.3.3 Repeat the procedure for a minimum of 20 tufts or loops, spread evenly through available samples, taking care that these are at least 25 mm between the previously withdrawn tuft or from the edge of the specimen.

B-3.4 Report

Report the average of the tests to the nearest 50 gf as the tuft withdrawal force.

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Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 11002
Telephones : 331 01 31, 331 13 75

Telegrams : Manaksanstha
Common to all Offices)

Regional Offices :	Telephone
Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110002	331 01 31 331 13 75
Eastern : 1/14 C. I. T. Scheme VII M, V. I. P. Road, Maniktola CALCUTTA 700054	37 84 99, 37 85 61 37 86 26, 37 86 62
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